1 General Scope

1.1 The Web Enterprises Services and Technology (hereinafter referred to as WESTPRIME) contract shall provide NASA with an agency-wide capability to create, maintain and manage web sites – primarily www.nasa.gov -- and associated ancillary services. Those services shall include content management, search and collaborative tools such as blogs and wikis.

1.2 The goals of the WESTPRIME contract are to:

1.2.1 Provide web services that shall meet the needs of NASA's diverse web community.

1.2.2 Improve current system, provide technology refresh and apply industry best practices.

1.2.3 Improve agility in adoption of tools and implementation of services.

1.2.4 Provide diversity of options for users while managing cost and scope.

1.3 The WESTPRIME contract shall also support some internal-facing services, such as www.insidenasa.nasa.gov and the NASA Engineering Network (NEN), which have internal and external users.

1.4 The WESTPRIME contract shall focus on performance metrics. NASA's interest shall be in the contractor's performance against the metrics rather than in the contractor's implementation. NASA shall also be very interested in the contractor's approach to infusing new technology into the infrastructure.

1.5 The WESTPRIME contract is one of five contracts under the Agency Chief Information Officer's Information Technology Infrastructure Integration Program (I3P). The WESTPRIME contractor shall be expected to work with the other I3P contractors where WESTPRIME services need to be integrated with those other contracts. For example, the WESTPRIME contractor shall be expected to provide Tier 2 Support Services, integrated with the Enterprise Service Desk to be provided by NASA at the NASA Shared Services Center.

1.6 The WESTPRIME contractor shall also support NASA's efforts to use Information Technology Infrastructure Library, version 3, lifecycle processes.

2 General Requirements

2.1 The contractor shall provide Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) for internal and external websites and web applications. Services provided collectively in IaaS, PaaS, and SaaS shall be referred to as the "**offerings**" hereforth.

2.2 The contractor shall provide the Cloud Broker Role as defined in NIST Special Publication 500-292 "NIST Cloud Computing Reference Architecture: http://www.nist.gov/manuscript-publication-search.cfm?pub_id=909505.

2.3 The contract shall integrate security into each layer of the offerings so that they are fully Authorized to Operate and continuous monitoring has been incorporated to effectively manage information systems security.

2.4 The contractor shall provide the offerings in the base for the 140 web sites and web applications managed by the current contract including NASA's primary public website, www.nasa.gov and NASA's Intranet, www.insidenasa.nasa.gov.
2.5 The contractor shall be well versed in agile processes.
2.6 The contractor shall provide the tools, services and administrative support required to meet the operational functionality as noted in these requirements.
2.7 The contractor shall provide and regularly update documentation and training necessary for system administrators, web developers, content authors, and other personnel to successfully use the offerings.
2.8 The contractor shall recommend an integration strategy and related processes for incorporating designated NASA web sites and services into these offerings.
2.9 The contractor shall report off-the-shelf integration capabilities with web application servers, transactional applications, back-office systems, legacy data sources, and third-party applications.
2.10 The contractor shall provide ongoing technical design and implementation support for new elements as they are created or incorporated within the existing overarching design of sites provisioned through this contract.
2.11 The contractor shall utilize NASA's digital assets and extend its "high tech" image through the approach by using leading-edge products, tools and services along with demonstrated industry standards.
2.12 The contractor shall use industry-standard components and processes, as demonstrated by the use of those components and processes by industry leaders, in fulfillment of these requirements. Exceptions to using industry-standards components and processes are approved by the COTR.
2.13 The contractor shall use primarily free open source software (FOSS) unless a clear advantage can be demonstrated in selection of non FOSS to NASA.
2.14 The contractor shall provide all services in accordance with applicable laws, regulations, and NASA procedural and regulatory guidance.
2.15 IDIQ Task Orders shall provide additional functional enhancements, increased scaling of the offerings, and all other enhancements and updates.
2.16 The contractor shall use NASA specified authentication services to authenticate users to NASA systems that require access control.
2.17 The contractor shall provide the capability to authenticate users external to NASA to all systems within this contract.
2.18 The contractor shall be responsible for cost-effective and efficient transition of the NASA shared public web infrastructure to a subsequent contractor at the completion of the contract.
2.19 The contractor shall plan for and implement technology innovation throughout the environment and over the life of the contract to reduce NASA's costs and increase productivity and customer satisfaction.
2.20 The contractor shall support NASA's overall I3P program by coordinating with contractors on other contracts to optimize service to NASA users, provide enhanced services to the public, while minimizing duplication of effort, leveraging innovative technologies to maximize cost effectiveness to NASA, and reducing gaps in services.

2.21 The contractor shall provide only tools that are fully functional through a cross-platform web interface that does not require additional software be loaded onto a user's computer and that complies with NASA Desktop Standard 2804.

3 General Administration

3.1 Policy Compliance

3.1.1 The contractor shall manage all systems and services provided under this contract in compliance with federal laws and regulations and NASA policy, including but not limited to:

3.1.1.1 NASA Policy Directive and NASA Procedural Requirement 1440, "*Records Management.*"

3.1.1.2 NASA Policy Directive and NASA Procedural Requirement 2810, "*Information Technology Security.*"

3.1.1.3 Section 508 of the Rehabilitation Act of 1973 for Electronic and Information Technology, per Subpart B - Technical Standards, Web-based Intranet and Internet Information and Applications (1194.22) parameters and guidelines.

3.1.1.4 NASA's Privacy Policy: NASA Procedural Requirement 1382.1, "*NASA Privacy Procedural Requirements*," and NASA Policy Directive 1382.17H.

3.1.1.5 NASA Software Engineering Requirements, NASA Policy Directive 7150.2.

3.1.1.6 Compliance with Internet Protocol version 6 (IPv6) in Acquiring Information Technology.

3.1.2 This contract involves the acquisition of Information Technology (IT) that uses Internet Protocol (IP) technology. The contractor shall ensure that (1) all deliverables that involve IT that uses IP (products, services, software, etc.) comply with IPv6 standards and interoperate with both IPv6 and IPv4 systems and products; and (2) it has IPv6 technical support for fielded product management, development and implementation available. If the contractor plans to offer a deliverable that involves IT that is not initially compliant, the contractor shall (1) obtain the Contracting Officer's approval before starting work on the deliverable; and (2) have IPv6 technical support for fielded product management, development and implementation available.

3.2 Communications and outreach

3.2.1 The contractor shall participate in planning sessions as designated by the COTR.

3.3 Outage and Restoration Notification.

3.3.1 The contractor shall follow I3P policy for notification of outages and restoration.

3.3.1.1 The contractor shall integrate with the Enterprise Service Desk to fulfill these requirements.

3.3.2 The contractor shall provide a capability for NASA users to suggest improvements to any aspect of the enterprise web services provided by this contract.

3.3.3 The contractor shall weekly review, prioritize and disposition user comments, including comments received through the Enterprise Service Desk, with NASA.
3.3.4 The contractor shall work with NASA Web Services Office to determine configuration "lockdown" periods so infrastructure changes and improvements do not limit service during high-traffic periods, such as during special events.

3.4 IDIQ Pricing

3.4.1 The contractor shall develop a pricing and chargeback model for IDIQ tasks.
3.4.2 The contractor shall work with Office of Chief Information Officer (OCIO) to implement the chargeback model via NASA's accounting and financial systems.

4 Project Management

4.1.1 Contractor shall manage projects under this contract in accordance with NASA Program Requirement 7120.7.
4.1.2 The contractor shall document all services, tools, information architecture, processes, and configuration management processes and policies used to manage this task and provide documentation to NASA.
4.1.3 The contractor shall present technology plan updates quarterly.
4.1.4 The contractor shall provide a secure, authenticated, Web-based interface for change requests and incident tracking.
4.1.5 The contractor shall integrate this system with the Enterprise Service Desk.
4.1.6 The contractor shall provide a secure, authenticated, collaborative site for contractor and NASA personnel to manage the contract.
4.1.7 The contractor's program manager shall be present for regular meetings with the NASA COTR and other NASA officials as required by the COTR within 24 hours notice. Note: The NASA COTR is located in the Washington DC area.

5 Help and Service Support

5.1 This section describes the support services the contractor shall provide and how those services shall integrate with the Enterprise Service Desk.

5.2 General Help and Service Support

5.2.1 Contractor shall provide Tier 2 and Tier 3 help desk support, incident response, problem management and service-ordering capabilities.
5.2.2 Contractor shall integrate its Tier 2 and Tier 3 help desk support, incident response, and problem-management and service-ordering systems with NASA's I3P Enterprise Service Desk, as described in NASA's I3P Cross-Functional Performance Work Statement and align them with I3P ITIL processes.
5.2.3 Contractor shall use the same software that the I3P Tier 1 Enterprise Service Desk uses for incident tracking, reporting and service ordering, which is currently Remedy, version 7.5.
5.2.4 Contractor shall not consider a ticket closed until it is notified that the Enterprise Service Desk has closed it.

5.2.5 Contractor shall provide appropriate training materials in a compatible format and scripts to the Enterprise Service Desk to help them triage calls properly.
5.2.6 Contractor shall provide materials as requested by the Enterprise Service Desk for posting to the Tier 0 website.
5.2.7 Contractor shall provide escalation procedures to the Enterprise Service Desk
5.2.8 Contractor shall report all downtime, planned and unplanned, to the Enterprise Service Desk and the Service Integration Management team of the Office of the Chief Information Officer.

5.3 Help Desk support

5.3.1 Contractor shall provide Tier 2 and Tier 3 help-desk support 8 a.m. to 8 p.m. Eastern U.S. time on days when the federal government or the Jet Propulsion Laboratory is open, even if the contractor is closed on that day.
5.3.2 Contractor shall provide 24/7 contact information to the Enterprise Service Desk and revise the information as necessary to keep it current.
5.3.3 Contractor shall provide Tier 2 help-desk support via phone, e-mail and live chat.
5.3.4 Contractor shall provide staff, management and technical capabilities during special events to monitor all essential systems and respond immediately to issues.
5.3.4.1 Additional special-events support shall be provided under the IDIQ portion of this contract.

5.4 NASA Customer Feedback

5.4.1 Contractor shall review all input from NASA customers received via Enterprise Service Desk (ESD) customer-satisfaction surveys and report these results to NASA.
5.4.2 Contractor shall review with NASA all ESD surveys that customers rate as "dissatisfied" or "very dissatisfied" and develop plans for improvement.

5.5 Subcontractors and partners

5.5.1 Contractor shall ensure that support infrastructure(s) used by its subcontractors and partners integrate with the NASA Enterprise Service Desk as described in the NASA Enterprise Service Desk Interface Definition Agreement.
5.5.2 Contractor shall ensure that its subcontractors and partners provide support necessary to allow the contractor to meet the requirements of this section.

5.6 Service Ordering

5.6.1 Contractor shall integrate with the NASA Enterprise Service Request System (ESRS) so that orders for IDIQ services are placed with the Enterprise Service Request System before being transferred to the contractor.

5.7 Performance Metric

5.7.1 Contractor shall meet a performance metric for customer satisfaction.
5.7.2 Contractor's performance metric shall be rated unsatisfactory no more than 4 percent of all tickets issued by the ESD to the contractor.

5.8 IT Incident Response

5.8.1 Contractor shall respond to IT incidents based on their severity level.

5.8.2 Contractor shall respond to incidents 24/7 as necessary to meet Service Level Agreements and availability metrics.

5.8.2.1 Severity Level 1 IT incidents are defined as a complete loss of critical business services where there is no work-around, and/or a service level agreement is not being met. An example of a Severity Level 1 incident would be www.nasa.gov is unavailable.

5.8.2.2 Severity Level 2 IT incidents are defined as a partial loss or degradation of critical business services where there is no work-around, and a number or people or organizations are affected.

5.8.2.3 Severity Level 3 IT incidents are defined as a loss or degradation of non-critical business services where a small number of people or organizations are impacted and where there is a work-around.

5.8.2.4 Severity Level 4 IT incidents are defined as a loss or degradation of non-critical business services where individual users are impacted and where there is a work-around.

5.8.3 Severity Levels 1 and 2 return to service shall be measured in real time hours.

5.8.4 Severity Levels 3 and 4 return to service shall be measured in business hours.

5.9 Return to Service Metrics

5.9.1 For Severity Level 1 IT Incidents, the maximum time to return to service shall be 2 hours.

5.9.2 For Severity Level 2 IT Incidents, the maximum time to return to service shall be 4 hours.

5.9.3 For Severity Level 3 IT Incidents, the maximum time to return to service shall be 8 hours.

5.9.4 For Severity Level 4 IT Incidents, the maximum time to return to service shall be 16 hours.

6 End User Training

6.1 NASA operates and maintains an online training system for all NASA Employees and contractors called SATERN (http://satern.nasa.gov), which provides the opportunity to implement standard training processes across the Agency and ease of delivery and administration of training courses and schedules. For all courses, instructor led or online/self-paced, this system is used to schedule, register and record results of courses offered by Agency organizations, programs, and projects. If desired, the system can also be used to deliver SCORM-based online/self-paced courses and record test scores. See the library for links to SATERN information.

6.2 NASA does not charge organizations, programs or projects for the use of SATERN. However, course owners are responsible for the administration of their related courses and development of SCORM-based materials for training delivered online. NASA does offer course content development services, including material conversion to SCORM, on a fee for service basis.

6.3 Contractor shall provide professional training so that new non-technical users can successfully use the offerings provided by the contractor.
6.4 Contractor shall provide and regularly update documentation and training necessary for system administrators, web developers, content authors, and other personnel to successfully use the Offerings.
6.5 Contractor shall provide training manuals written in a clear and technically appropriate language on each process and application.
6.6 Contractor shall provide two days of face-to-face training at each NASA center for up to 20 civil servants and contractors, at least once annually at each center, plus additional days at NASA's designation, for a total of 25 days of training.
6.7 Contractor shall provide online help tutorials.
6.8 Contractor shall provide training to existing users when new processes are implemented or current processes are updated.
6.9 Contractor shall provide training on the different service offerings for up to 50 civil servants and contractors as designated by NASA no later than four weeks before go live.
6.10 Contractor shall provide all current NASA users with requested training within 30 days after contract award,to provide sufficient time for them to execute their duties.
6.11 Contractor shall provide a "sandbox" implementation of content-management and other tools that allow NA SA users to test procedures and familiarize themselves with the tools without affecting the production environment.
6.12 Contractor shall coordinate (schedule, register and record) all formal training through the NASA SATERN system.
6.13 Contractor shall allow for NASA users to purchase additional training services under the IDIQ portion of the contract.
6.14 Contractor shall offer trainees the opportunity to evaluate each training session on a scale of excellent, good, neutral, fair or poor.
6.15 Contractor shall maintain a service level metric of no more than 3 percent of all trainees in a quarterly period rating the contractor's training as poor.
6.16 Contractor shall maintain a service level metric of no more than 6 percent of all trainees in a quarterly period rating the contractor's training as fair or poor.

7 Content Delivery Requirements

7.1 General Availability Requirements

7.1.1 Availability, as defined in the glossary, shall be measured for each contract week from 12:01 a.m. Eastern time Sunday through midnight Eastern time Saturday.
7.1.2 Contractor shall meet the availability performance metric as defined in Availability options in Section 7.2.
7.1.3 The failure of any component system subject to the availability metric shall be deemed an overall failure to meet that metric.

7.2 Service Level for Availability

7.2.1 Contractor shall provide three offerings of availability for sites and services in this infrastructure as defined below.
7.2.2 Option 1 Availability (99.995 percent).
7.2.2.1 Contractor shall provide Option 1 availability for the externally facing NASA production Web site (www.nasa.gov), and the primary, externally facing search component (currently housed at search.nasa.gov).
7.2.3 Option 2 Availability (99.95 percent)
7.2.3.1 For some sites and application, Contractor shall provide Option 2 availability. For purposes of this calculation, negotiated planned downtime may be excluded from the calculation
7.2.4 Option 3 Availability (99.5%)
7.2.4.1 For other sites, including but not limited to, content management system and collaboration services, Contractor shall provide Option 3 availability. For purposes of this calculation, negotiated planned downtime may be excluded from the calculation.
7.2.5 Contractor shall provide ability for sites that would receive 99.5 and 99.95 percent uptime under the base to purchase 99.995 percent availability for specified durations as part of the IDIQ portion of the contract.

7.3 Bandwidth Management

7.3.1 Contractor shall provide baseline bandwidth for www.nasa.gov of 900 megabits per second (mpbs) for dynamic, non-streaming Web content at contract start.
7.3.2 Contractor shall provide baseline bandwidth for other sites of up to 0.5 mbps at contract start.
7.3.3 Contractor shall provide the capability to stream up to 200 terabytes of live and on-demand video per month in the first contract year.
7.3.4 Baseline bandwidth capabilities may increase 15 percent in each contract year.
7.3.5 Contractor shall provide a mechanism for total bandwidth usage for streaming and non-streaming content to peak at up to 60 gigabits per second for short periods of time.
7.3.6 Contractor shall provide a plan for rapidly increasing available total bandwidth for streaming and non-streaming content up to 80, 100 and 120 gigabits per second (gbps) to accommodate of an unplanned event that places NASA content in high demand.
7.3.7 Contractor shall provide additional bandwidth throughout the period of performance sufficient to meet performance metrics.
7.3.8 Contractor shall allow all NASA sites to purchase additional bandwidth allocation.
7.3.9 Contractor shall provide a secure, web-based tool for NASA to monitor bandwidth usage for all sites and services in real-time.
7.3.9.1 The tool shall provide NASA users with the capability to monitor individual NASA web sites' bandwidth usage.
7.3.9.2 The tool shall provide historical data to allow trend analysis.

7.3.10 Contractor shall manage bandwidth usage within contractual limits and procedural guidelines set forth by NASA so there shall be no unanticipated bandwidth costs to NASA.

7.3.11 Contractor shall provide a plan for advance notification of expected traffic patterns, based on upcoming events and historical data, to allow NASA to manage priorities for bandwidth allocation and usage.

7.4 Contractor shall meet the following performance for content delivery benchmarks at contract start

7.4.1.1 15 Gbps of web content delivery.

7.4.1.2 500 Gbps of streaming content delivery.

7.4.1.3 Sufficient network capacity to its content-management tool that content files size 1 megabyte or less shall upload to the content-management tool in 7.5 seconds or less. Note that the SLA gives the COTR the ability to waive this requirement if it's beyond the contractor's control, e.g., NASA LANs aren't sufficiently sized to allow this.

7.5 Contractor shall meet page load of 7.5 seconds or less for all content management tools pages as measured by a third party service such as Webmetrics

7.5.1.1 Contractor shall measure page load over the course of a week, measured from 12:01 a.m. Eastern U.S. time Sunday through midnight Eastern U.S. time Saturday.

7.5.2 Contractor shall perform load testing on all components of the proposed system twice a year to ensure performance at the levels prescribed by NASA.

7.5.3 Contractor shall not perform load tests during special events.

7.5.4 Contractor shall report the results of the load test to NASA as part of the Program Management Plan required.

7.6 Publication Times

7.6.1 Contractor shall make content globally visible within 10 minutes after it is published.

7.6.2 Contractor shall make a small subset of content designated by NASA is globally publicly visible within one minute after publication

7.7 Delivery capabilities for live and on-demand video streaming

7.7.1 Contractor shall provide streaming of live and stored content in industry-standard cross-platform format(s) designated by NASA (e.g., Adobe Flash) from NASA or NASA-approved non-NASA sources.

7.7.2 Contractor shall provide round-the-clock streams designated by NASA. At the contract start date these shall include:

7.7.2.1 NASA TV public channel

7.7.2.2 Audio-only news conferences

7.7.3 Contractor shall have the capacity to provide other streams as designated by NASA.

7.7.4 Contractor shall provide multiple ingress points for streaming content generated from geographically distributed sources.
7.7.5 Contractor shall stream NASA Television at a minimum resolution of 500 pixels by 307 pixels and a minimum bit rate of 750 kilobits per second.
7.7.6 Contractor shall provide the ability to display captions when available.
7.7.7 Contractor shall deliver capabilities for downloadable audio and video formats. E.g. mpeg3 and mpeg4

7.8 Handheld/Mobile

7.8.1 Contractor shall optimize designated NASA content for mobile and handheld devices and automatically make it available to those devices without NASA users having to reformat or republish content.

7.9 Contractor shall work with designated external content partners to provide integrated services.
7.9.1 Contractor shall present search results from nasaimages.org integrated with image-search results from www.nasa.gov.

8 Infrastructure-as-a-Service Requirements

8.1 Contractor shall provide generic execution environments capable of supporting multiple operating systems utilizing x86-64 instruction set architecture, including GNU/Linux distributions, Microsoft Windows Server, and Unix-like distributions.
8.1.1 Contractor shall provide execution environments that must be accessible on-demand and take no longer than 5 minutes to provision.
8.1.2 Contractor shall provide execution environments that must be fully controllable through application programmer interfaces such that they may be started, terminated, manipulated/modified, and scheduled programmatically without recourse to support personnel.
8.1.3 Contractor shall provide execution environments that must be fully controllable through application programmer interfaces singularly or in batch operation.
8.1.4 Contractor shall provide scenarios in which virtualization is employed, utilizing only open source hypervisors and data formats capable of transport and operation between virtualization environments.
8.1.5 Contractor shall provide scenarios in which virtualization is employed, utilize hardware assisted processor virtualization.
8.1.6 Contractor shall provide scenarios in which virtualization is employed, permit para-virtualization of storage and network interfaces.
8.1.7 Contractor shall provide specification of underlying host node when creating new execution environments to support higher level fault node fault tolerance constructs.
8.1.8 Contractor shall provide specification of geographic region when creating new execution environments.
8.1.9 Contractor shall provide provisioning of execution environments by at least two independent providers for hybrid cloud support.

8.1.10 Contractor shall provide load distribution between at least two independent providers for hybrid cloud support and special event support as needed.
8.1.11 Contractor shall provide specification of provider when creating new execution environments.
8.1.12 Contractor shall provide archiving and retrieving execution environments for external storage or redeployment.
8.1.13 Contractor shall provide ability to snapshot/image a running execution environment and create additional execution environments based on such snapshots/images.
8.1.14 Contractor shall provide default operating system images to be deployed on execution environments must meet applicable NASA and Federal security baseline requirements, such as those published by NIST and required for FISMA, at various levels of certification and confidence.
8.1.15 Contractor shall provide execution environments to be suspended, quarantined, and captured for forensic analysis by NASA IT security.
8.1.16 Contractor shall provide application and system software on baseline security hardened images shall also be centrally managed and conform to applicable security baselines, such as those benchmarks published by the Center for Internet Security.
8.1.17 Contractor shall provide supplementary services required for security compliance such as identity management, authentication and authorization, and log aggregation/analysis shall be provided and integrated with existing NASA solutions.
8.1.18 Contractor shall provide baseline security hardened images that are centrally maintained and updated in response to new evolving security requirements and vulnerability scenarios.
8.1.19 Contractor shall provide baseline security hardened images that are continuously monitored for security compliance with any deviations monitored, tracked, reported, and mitigated or corrected (configuration management).
8.1.20 Contractor shall provide execution environments operating baseline security hardened images that have the capability to be collectively modified in response to new and emerging threats or to proactively reduce vulnerabilities.
8.1.21 Contractor shall remain abreast of developments in cyber security as they relate to offered services, such as by maintaining active membership is security communities and fora, and proactively work with NASA IT security to identify and mitigate new and emerging threats.
8.1.22 Contractor shall provide security controls defined by NASA and shall be subject to ongoing amendment and validation.
8.1.23 Contractor shall provide cloud services that are FedRAMP certified.
8.1.24 Contractor shall provide integration of resources operated at the infrastructure as a service level with NASA web application registration and tracking systems to ensure policy compliance, proper review, and traceability/ accountability.
8.1.25 Contractor shall provide resources that are user-definable such that any combination of processing power, memory allocation, and storage allocation can be requested and delivered within established time frames for system provisioning.

8.1.26 Contractor shall provide execution environment resources such as processing power, memory allocation, and storage allocation that are capable of increase or decrease after initial activation.
8.1.27 Contractor shall provide capability of live migration between underlying nodes from both within a defined cluster and between defined clusters.
8.1.28 Contractor shall provide persistent block storage in arbitrarily definable capacities.
8.1.29 Contractor shall provide block storage devices with sustained throughput of 100 MB/sec.
8.1.30 Contractor shall provide HTTP object storage.
8.1.31 Contractor shall provide HTTP object replication, holding minimally 3 copies for fault tolerance.
8.1.32 Contractor shall provide block storage that is portable between execution environments.
8.1.33 Contractor shall provide full back ups of execution environments.
8.1.34 Contractor shall provide full back ups of block storage devices.
8.1.35 Contractor shall provide incremental back ups of execution environments (snapshots).
8.1.36 Contractor shall provide incremental back ups of block storage devices.
8.1.37 Contractor shall provide automation of all back up scenarios through a management dashboard.
8.1.38 Contractor shall provide automation of all back up scenarios through application programmer interface.
8.1.39 Contractor shall provide flexible back up schedules for objects subject to back up protection.
8.1.40 Contractor shall provide capability for varied back up schedules for individual and defined groupings of objects subject to back up protection.
8.1.41 Contractor shall test the efficacy of random back ups at negotiated intervals.
8.1.42 Contractor shall provide tiered access controls to management interfaces, both graphical and command line or application programmer interface.
8.1.43 Contractor shall provide multi-user access to management interfaces, both graphical and command line or application programmer interface.
8.1.44 Contractor shall provide aggregate and individualized load monitor of all execution environments, including processor load, number of processes, memory utilization, storage utilization, storage throughput, storage operations per seconds, storage seek time, network throughout, network packet loss, and network connections.
8.1.45 Contractor shall provide content distribution.
- 8.1.45.1 Contractor shall provide edge computing content distribution as a service for applications running atop the infrastructure and platform services.
- 8.1.45.2 Contractor shall allow for applications to be delivered over the content distribution network on-demand.
- 8.1.45.3 Contractor shall provide content caching where appropriate.

8.1.45.4 Contractor shall provide service monitoring and reporting dashboard capable of producing customizable reports at flexible intervals.

9 Platform-as-a-Service Requirements

9.1 Contractor shall provide source-control based workflow for deploying user applications atop managed execution environments.

9.1.1 Contractor shall provide software execution and publication workflow to support tiered automated and manual reviews depending on the deployment role such as development, staging, testing, and production.

9.1.2 Contractor shall provide integrated support for code testing frameworks such that code tests are executed and the results returned to the user prior to final deployment at the requested level (development, staging, testing, and production).

9.1.3 Contractor shall provide automated tools for security reviews of code to identify common security errors in applications and have the results returned to the user prior to final deployment at the requested level (development, staging, testing, and production).

9.1.4 Contractor shall permit different policy profiles in terms of required automated and manual reviews, level of review, and approval routing to be independently set for different operational levels/deployment roles such as development, staging, testing, and production.

9.1.5 Contractor shall provide integration with NASA web application tracking and registration systems for defined operational levels/ deployment roles such as development, staging, testing, and production.

9.1.6 Contractor shall provide roll-back functionality to flexible source check-ins.

9.1.7 Contractor shall develop and maintain execution environments capable of operating applications developed in a variety of defined programming languages and frameworks.

9.1.8 Contractor shall provide all software outside of user supplied code such as operating systems, application software, and system software must meet baseline NASA and Federal IT security requirements.

9.1.9 Contractor shall provide the capability for all software outside of user-supplied code to be centrally managed and continuously monitored.

9.1.10 Contractor shall provide the capability for all software outside of user-supplied code to be updated in response to new evolving security requirements and vulnerability scenarios.

9.1.11 Contractor shall provide the capability for all software outside of user-supplied code to be collectively modified in response to new and emerging threats or to proactively reduce vulnerabilities without disruption to and independent from user software.

9.1.12 Contractor shall remain abreast of developments in cyber security as they relate to offered services, such as by maintaining active membership is security communities and fora, and proactively work with NASA IT security to identify and mitigate new and emerging threats.

9.1.13 Contractor shall provide cloud services that meet FISMA Moderate certification requirements.
9.1.14 Contractor shall provide and support python, ruby, java, php, .NET and others as needed.
9.1.15 Contractor shall provide documentation on limitations and general guidance, including and requirements which may be unique to the system, on how to write software for deployment on managed execution environments.
9.1.16 Contractor shall maintain and update system software such as the underlying operating system, servers, interpreter, gateways, and other software required to execute user applications in execution environments independently of user applications.
9.1.17 Contractor shall maintain common services independently of user applications, such as database services, logging services, queuing and scheduling services, map reduce, messaging services, key value stores, caching services, identity management and authentication services, monitoring services, and storage services.
9.1.18 Contractor shall provide automated scaling in response to load.
9.1.19 Contractor shall provide web-based graphical management dashboard for all functions.
9.1.20 Contractor shall provide application programmer interface for all functions.
9.1.21 Contractor shall provide tiered access controls to management interfaces, both graphical and command line or application programmer interface.
9.1.22 Contractor shall provide multi user access to management interfaces, both graphical and command line or application programmer interface.
9.1.23 Contractor shall allow for network access restrictions by IP and by access key.
9.1.24 Contractor shall allow for flexible IP access groups.

9.2 Network Connectivity

9.2.1 Contractor shall provide ability to configure approved public IP addresses to execution environments.
9.2.2 Contractor shall provide ability to configure approved private IP addresses to execution environments.
9.2.3 Contractor shall provide ability to programmatically allocate, assign, release, and reassign public IP addresses to execution environments.
9.2.4 Contractor shall provide network connectivity from execution environments to the public Internet should operate at 1 Gbps.
9.2.5 Contractor shall provide network connectivity between execution environments to operate at 1 Gbps.
9.2.6 Contractor shall allow for flexible IP firewall rule sets between execution environments and the public Internet.
9.2.7 Contractor shall allow for flexible IP firewall rule sets between execution environments.
9.2.8 Contractor shall allow for NASA IT security audit and direct access to all firewall rule sets, wherever situated.
9.2.9 Contractor shall allow for active and passive network packet inspection and collection for all execution environments by NASA incident response staff.

9.2.10 Contractor shall permit targeted network traffic analysis and packet inspection and collection for specific execution environments by NASA incident response staff.

9.2.11 Contractor shall provide access to and integration with NASA DNS systems as needed.

10 Software-as-a-Service Requirements

10.1 Contractor shall provide content Tools Features/ Attributes:

10.1.1 Contractor shall provide content management tools that have the following features and attributes:

10.1.2 Contractor shall provide the capability to support the current base of content and information used to store 700,000 web pages and associated files at contract start.

10.1.3 Contractor shall provide the capability to support 50 TB of content storage.

10.1.4 Contractor shall provide the capability to support 10,000 content updates per month with peak periods of 200 updates per hour.

10.1.5 Contractor shall provide the capabilities to utilize Content Management Interoperability Standards (CMIS).

10.1.6 Contractor shall provide the capability to build upon software with accessible source code wherever possible.

10.1.7 Contractor shall provide software that is licensed under open source or GPL licenses wherever possible.

10.1.8 Contractor shall provide user performance support features:

- 10.1.8.1 Contractor shall provide support for 1000 users at contract start.
- 10.1.8.2 Contractor shall provide support for as many users as required by NASA (currently approximately 1000 distinct users) in more than a dozen physical locations while still meeting performance requirements.
- 10.1.8.3 Contractor shall provide support for 100 simultaneous users while still meeting performance standards.
- 10.1.8.4 Contractor shall provide support for hundreds of updates per day, and dozens of updates per day to a single or collection of assets by multiple users, while still meeting performance requirements.

10.1.9 Contractor shall provide capability that is fully functional through cross-platform web interface and does not require additional software be loaded onto a user's computer and complies with NASA Desktop Standard 2804.

10.1.10 Contractor shall provide the following image management features

- 10.1.10.1 Contractor shall provide automated image resizing features that create multiple image file assets to conform to predefined standards regardless of the size or aspect ratio of the original image.
- 10.1.10.2 Contractor shall provide automated image import features that imports multiple images and associated metadata from a remote location and embeds them on web pages and submits them to workflows as authorized by the user.

10.1.11 Contractor shall provide the following video asset management features
- 10.1.11.1 Contractor shall provide a process for creating linking files (e.g., files with mime types such as .ram or .asx) for videos requiring captioning, that allows the user to upload the caption file and automatically creates the linking file (see "Use Cases: Current Content Management Capabilities" in the exhibits library and Section 14, Video Services.)

10.1.12 Contractor shall provide content submission via email features
- 10.1.12.1 Contractor shall provide the ability to allow pages to be updated by sending an e-mail to a specified address, which automatically converts the e-mail text to an RSS feed and embeds it on a designated page.

10.1.13 Contractor shall provide the following content output formatting features
- 10.1.13.1 Contractor shall allow users to output the content at any stage of its creation in PDF, plain paper or NASA letterhead for review by NASA personnel without accessing the content-management tool(s).

10.1.14 Contractor shall provide multi language support features
- 10.1.14.1 Contractor shall support ingest and display of content in multiple languages.
- 10.1.14.2 Contractor shall provide English and Spanish at contract start. Requirements for other languages shall be requested under the IDIQ portion of this contract.

10.1.15 Contractor shall provide publishing and workflow features
- 10.1.15.1 Contractor shall allow content to be entered once and published to multiple sites and services without additional entry,
  - 10.1.15.1.1 including: www.NASA.gov and other external web sites;
  - 10.1.15.1.2 internal NASA sites;
  - 10.1.15.1.3 mobile devices, including smartphones and tablets; and
  - 10.1.15.1.4 third-party services such as Facebook and Twitter.
- 10.1.15.2 Contractor shall provide automated publishing features - whether through metadata or some other means, of related content simultaneously with the publication of particular content; for example, when a news release is published, the content management tool should automatically publish all collections, pages or other content aggregations that include reference to that press release.
- 10.1.15.3 Contractor shall provide emergency publish features - the ability for designated users to expedite the publication process, bypassing intermediate steps for urgent reasons.
- 10.1.15.4 Contractor shall provide the capability to automatically publish any content in a variety of different formats from single content origin, including, but not limited to, email, PDF, multiple devices such as tablets, cell phones, and PDAs and others as identified by the COTR.

10.1.15.5 Contractor shall provide the ability to publish any Web content asset immediately, at a scheduled time, periodically, or based on metadata attributes.

10.1.15.6 Contractor shall provide ability for designated users to remove published content completely from the public site and any related sites (e.g., mirror sites or caching networks) to which it has been published.

10.1.15.7 Contractor shall provide ability for designated users to publish multiple content items in bulk.

10.1.15.8 Contractor shall provide a customizable workflow capability that allows customizations of content management publishing processes by multiple roles, including creation, deletion, updating of roles or steps, and modifying rules within the workflows.

10.1.15.9 Contractor shall allow workflows to be assigned by content type, for example a podcast.

10.1.16 Contractor shall provide the following metadata features

10.1.16.1 Contractor shall provide use of common metadata formats such as Dublin Core.

10.1.16.2 Contractor shall provide use of the NASA Taxonomy (http://nasataxonomy.jpl.nasa.gov).

10.1.16.3 Contractor shall provide use of automated addition of metadata to content via the NASA STI machine-aided indexing system (reference: http://mai.larc.nasa.gov/home.jsp.)

10.1.17 Versioning and auditing features

10.1.17.1 Contractor shall provide date and time stamped versioning for each piece of content.

10.1.17.2 Contractor shall provide version control and archiving for content elements.

10.1.17.3 Contractor shall provide the ability to rollback to specified versions of content.

10.1.17.4 Audit trails of content updates.

10.1.18 Contractor shall provide the following multimedia asset management features

10.1.18.1 Contractor shall provide support for the following video and audio formats: WindowsMedia, RealMedia, QuickTime, DIVX, MPEGs-2, 3 and 4, Adobe Flash, HD Web Video formats 480p, 720p, 1080i.

10.1.18.2 Contractor shall provide web based upload capabilities into content management tools

10.1.18.3 Contractor shall provide media transcoding features from common video and audio file formats/codecs including but not limited to WindowsMedia, RealMedia, QuickTime, DIVX, MPEG-2/3/4) uploaded by authenticated NASA users, into a commonly used cross-platform video-playback format, e.g, Adobe Flash and HTML 5, that works on all major desktop operating systems, within

standard Web browsers, and on iOS, Android and Blackberry mobile device.

10.1.18.4 Contractor shall provide media encoding features to encode standard video and audio formats into industry-standard Web video formats adopted by NASA for live streaming, on-demand streaming and download as part of the IDIQ portion of the contract.

10.1.18.5 Contractor shall provide bulk uploading tools for image and other digital media assets.

10.1.18.6 Contractor shall provide thumbnail or similar representation asset capabilities for multimedia display.

10.1.19 Contractor shall provide the following Navigation and Information Architecture Controls

10.1.19.1 Contractor shall provide the ability for users designated by NASA to create or edit Web site navigation elements in defined areas.

10.1.19.2 Contractor shall provide the ability to generate, upon authorization by NASA, site maps or content maps for logical content collections.

10.1.19.3 Contractor shall provide the ability to automatically generate bread crumb trails that are live links to the labeled content.

10.1.20 Contractor shall provide the following CMS Search and Discovery Utilities

10.1.20.1 Contractor shall provide capability to provide a single interface to search multiple content repositories. For example, a CMS, blogging tools, and digital asset management repository.

10.1.20.2 Contractor shall provide internal search capabilities to find content based on title, content title, keywords, date created, date modified, and other unique identifying elements.

10.1.20.3 Contractor shall provide discovery tools to facilitate the reporting of content items which have been linked to, embedded in, as well as items embedded within the content.

10.1.21 Contractor shall provide the following extensible capabilities

10.1.21.1 Contractor shall provide capabilities to optimize for Web content display for different use cases such as small organizational or project sites. Provide a data catalog (typically an index to data sets that provides methods to browse and explore data collections); Examples of sites with a data catalog publication model include http://heasarc.gsfc.nasa.gov and http://gcmd.gsfc.nasa.gov.

10.1.21.2 Contractor shall provide built-in web API interfaces to expose NASA approved data and functionality for increased application interoperability.

10.1.22 Contractor shall provide the following user access and authoring functionality

10.1.22.1 Contractor shall provide role-based access to content and sections of the content management tool(s) as designated by NASA.

10.1.22.2 Contractor shall provide for multiple, simultaneous user authoring while still meeting performance requirements.

10.1.22.3 Contractor shall provide for multiple authoring modes, such as web forms with plain text, e-mail and e-mail updates to RSS feeds.

10.1.22.4 Contractor shall provide a WYSIWYG editing environment, equivalent to an interface for word-processing software, for all content development.
10.1.22.5 Contractor shall provide designated users the capability to create new templates.
10.1.22.6 Contractor shall allow designated users to create and modify workflows.
10.1.23 Contractor shall provide the following video content captioning
10.1.23.1 Contractor shall provide synchronized captioning technologies for all NASA supported videos to comply with Section 508 Standards for Electronic and Information Technology, Subpart B - Technical Standards, Web-based Intranet and Internet Information and Applications (1194.22) parameters and guidelines.
10.1.23.2 Contractor shall provide closed caption video upload utility.
10.1.23.3 Contractor shall provide vendor supported video captioning capabilities from a provided transcription.
10.1.24 Contractor shall provide a tool to check the continued validity of links from all sites managed within this infrastructure.
10.1.25 Contractor shall provision all tools that allow external visitors to contribute content to any site provisioned under this contract to require moderation by NASA users or authentication of the external visitor via a method approved by NASA.

11 Contractor shall provide Content Tools Responsibilities

11.1 Contractor shall manage an integrated suite of content-management tools for end-to-end content lifecycle management, including creation, update, modification, expiration, deletion, archive and retrieval with features indicated in the above section.
11.2 Contractor shall manage the capabilities required under the above section through a single interface that can manage all NASA Web content within the content management suite of tools including, but not limited to text, images, videos, wikis and blogs.
11.3 Contractor shall manage sufficient storage and capacity for growth to host all content designated by NASA while meeting performance metrics.
11.4 Contractor shall provide and maintain separate development, staging and production environments for content management tools.
11.5 Contractor shall provide user based authentication to the tools from outside NASA networks for designated users.
11.6 Contractor shall provide access controls that enable visibility in the staging environment(s) on NASA networks without user-based authentication.
11.7 Contractor shall provide access controls that enable visibility in the staging environment(s) to designated reviewers outside NASA.
11.8 Contractor shall provide a functional environment for development of:

11.8.1.1 Templates for "common functions", including but not limited to user survey, feedback form, etc., to all content developers with the ability for designated content developers to customize the input fields from a master template.

11.8.1.2 Templates that support creation of multiple versions of the same content. For example, in different languages or for different audiences, such as elementary and secondary students, that can be published to multiple designated locations; Or which can be published as static web content, RSS feed or mobile content.

11.8.1.3 New authoring and presentation templates where needed, to incorporate content into the public web infrastructure, when approved by NASA.

11.8.1.4 New publication work flows, where needed, to incorporate content external to the content management system.

11.9 Contractor shall provide technical and other support documentation:

11.9.1.1 Contractor shall provide and maintain professionally written technical documentation of the content management system(s) software operation. Provide and maintain professionally written technical documentation for all content management interfaces

11.9.1.2 Contractor shall provide and maintain professionally written technical documentation for NASA developers who create system components.

11.9.1.3 Contractor shall provide the ability to search all documentation online.

12 Software Services – Collaboration and Social Software Services

12.1 Contractor shall provide the following collaboration and social software tools as part of the enterprise web environment.

12.2 Contractor shall provide shared calendaring

12.2.1 This section describes requirements for the display of calendar events on a web page. It allows calendars to be embedded on a web site for external visitors to view upcoming events. It is not a requirement for an internal capability for NASA employees and contractors, which shall be provided by ACES.

12.2.2 Contractor shall provide a shared calendaring function that can support multiple users.

12.2.3 Contractor shall provide multiple views of a shared calendaring based on metadata provided by content editors, for example, mission events or educational events.

12.2.4 Contractor shall allow the calendar to be embedded on web pages.

12.2.5 Contractor shall allow calendar to be synchronized with external calendaring systems, including Microsoft Exchange and Entourage and Apple's Mail software.

12.3 Blogs:

12.3.1 This section describes th e requirements for a blog service, and enumerates the capabilities users and teams shall have.

12.3.2 Contractor shall provide the capability for NASA users to create and maintain blogs, either as individual users or as groups. This capability:

12.3.2.1 Shall allow for user creation, modification, and deletion of content.

12.3.2.2 Shall provide authentication of users for content entry and modification.

12.3.2.3 Shall allow for removal or restriction of users.

12.3.2.4 Shall allow for updates to content without modifying the publication date, i.e., for editorial correction.

12.3.2.5 Shall allow for anonymous viewing of unrestricted content

12.3.2.6 Shall allow for restricted access to blog content.

12.3.2.7 Shall have a WYSIWYG editor including but not limited to preview including embedded graphics.

12.3.2.8 Shall allow designated NASA users to customize the blog's appearance.

12.3.2.9 shall provide a page history, activity log, and archive for content

12.3.2.10 Shall support content export into other formats including but not limited to PDF, XML, Microsoft Word, ODF, mobile and PDA.

12.3.2.11 Shall support the ability for upload and link to file attachments including but not limited to Microsoft Office, multimedia, XML, and HTML.

12.3.2.12 Shall support the ability to search and index blog content.

12.3.2.13 Shall support the ability to easily embed, size and lay out images

12.3.2.14 Shall support page redirection.

12.3.2.15 Shall provide taxonomy support (namespaces, categories, and hierarchies) integrated to NASA Taxonomy.

12.3.2.16 Shall support change notification for publishers and users

12.3.2.17 Shall support tracking for orphaned pages.

12.3.2.18 Shall support blog comments.

12.3.2.19 Shall allow for moderation of blog comments or submissions.

12.4 Wikis

12.4.1 This section describes th e requirements for a wiki service, and enumerates the capabilities users shall have.

12.4.2 Contractor shall provide a wiki, that is, a collection of Web pages designed to enable anyone who accesses it to contribute or modify content, using a simplified markup language. This capability:

12.4.2.1 Contractor shall allow for user creation, modification, and deletion of pages

12.4.2.2 Contractor shall provide authentication of users for content entry and modification

12.4.2.3 Contractor shall allow for removal or restriction of users

12.4.2.4 Contractor shall allow for anonymous viewing of unrestricted wiki content

12.4.2.5 Contractor shall allow for restricted access to content

12.4.2.6 Contractor shall have a WYSIWYG editor including but not limited to preview including embedded graphics
12.4.2.7 Contractor shall provide a page history and archive for wiki content
12.4.2.8 Contractor shall provide templates for layout
12.4.2.9 Contractor shall allow customized layout
12.4.2.10 Contractor shall provide a page history, activity log, and archive for content
12.4.2.11 Contractor shall support content export into other formats including but not limited to PDF, XML, Microsoft Word, ODF, mobile and PDA
12.4.2.12 Contractor shall support the ability for file attachments including but not limited to Microsoft Office, multimedia, XML, and HTML
12.4.2.13 Contractor shall support the ability to search and index wiki content
12.4.2.14 Contractor shall support the ability to easily embed, modify, and layout images
12.4.2.15 Contractor shall support page redirection
12.4.2.16 Contractor shall have taxonomy support (namespaces, categories, and hierarchies) integrated to NASA Taxonomy
12.4.2.17 Contractor shall support change notification for publishers and users
12.4.2.18 Contractor shall support tracking for orphaned pages
12.4.2.19 Contractor shall support page comments
12.4.2.20 Contractor shall allow for moderation of page comments or submissions

12.5 Forums
12.5.1 This section describes the requirements for a threaded-discussion forum capability.
12.5.2 The contractor shall provide threaded discussion forums. This capability:
12.5.2.1 Contractor shall provide the ability to archive and search forum content
12.5.2.2 Contractor shall provide unmoderated user forums with user login
12.5.2.3 Contractor shall provide semi-moderated user forums with user login where users are moderated by moderator approval for posting and removal of postings after the fact
12.5.2.4 Contractor shall provide fully moderated user forums with user login and moderator approval of every post

12.6 Feeds/Alerts/Notification. Contractor shall provide the ability for external and internal users to subscribe to content based on specific categories of content. This capability:
12.6.1 Contractor shall output such automated syndication or subscriptions to multiple formats including but not limited to SMS, RSS, and to external mailing lists.

12.6.2 Contractor shall ensure that syndication channels identified by NASA (including inbound RSS and syndication) are incorporated into the www.nasa.gov site

12.6.3 Contractor shall coordinate and provide content-import services for content to be integrated. This task shall include the meta-tagging of content.

12.6.4 Contractor shall support syndication, by contractor or third-party, of content via automated e-mail alerts; This capability is currently provided by GovDelivery.

12.6.5 Contractor shall support automated ingestion of e-mailed content and embedding into web pages; this capability is currently provided by the current provider's email2RSS tool.

12.6.6 Contractor shall provide an alert capability for new or pre-defined items on a periodic basis that is at least daily.

12.6.7 Contractor shall provide the ability for users to modify their subscriptions to content managed within http://www.nasa.gov and the NASA shared public infrastructure.

12.6.8 Contractor shall provide a user-defined notification when an action is required to approve an item in any of these collaboration tools or the content-management tool(s).

12.6.9 Contractor shall provide a capability to e-mail press releases and other documents designated by NASA to lists of e-mail addresses

12.6.10 Contractor shall provide the capability to automatically ingest and republish content from third-party sites such as Twitter and Facebook.

12.7 Interactive Content

12.7.1 This section describes the requirements for a capability for users to comment on, rate, tag, and share NASA content. It includes the capability to recommend similar content to visitors to a particular page, and to display clouds of terms, such as user tags for a page, search queries, or other keywords. It also describes the requirements for tools for conducting polls, votes, and contests, and providing moderated, live chats.

12.7.2 Polls and Voting: Contractor shall provide tools for conducting polls of external users, allowing the vote on topics or in contests or to rank choices. This capability:

12.7.2.1 Contractor shall provide the ability to conduct polls of users (e.g., contests to name spacecraft or rank ideas).

12.7.2.2 Contractor shall provide for polls that allow multiple forms of response, e.g., single answer from a choice of several, multiple answers from a choice of several, or free text.

12.7.2.3 Contractor shall provide for polls that allow users to rank and order offered choices.

12.7.2.4 Contractor shall provide the ability to show or hide poll and quiz results.

12.7.2.5 Contractor shall provide polls and quizzes on any content type.

12.7.3 Commenting: Contractor shall provide the ability for users to comment on NASA content, with safeguards against inappropriate comments, on any Web page or feature. This capability:
- 12.7.3.1 Contractor shall provide the ability to accept comments.
- 12.7.3.2 Contractor shall prescreen comments for objectionable phrases including possible variants.
- 12.7.3.3 Contractor shall allow moderation of comments.
- 12.7.3.4 Contractor shall ensure comments are coming from users, not from automated systems.
- 12.7.3.5 Contractor shall allow for removal of comments.
- 12.7.3.6 Contractor shall allow comment responses.

12.7.4 Content Rating.
- 12.7.4.1 Contractor shall provide external visitors with the ability to rate content.
- 12.7.4.2 Contractor shall display the rating and number of ratings on the content.
- 12.7.4.3 Contractor shall automatically generate a "highest-rated" collection that can be embedded on a web page.
- 12.7.4.4 Contractor shall allow NASA users to limit the automated "highest-rated" collection to content that has received a minimum number of ratings.
- 12.7.4.5 Contractor shall allow for the creation of a "highest-rated" collection from among a subset of content (e.g., recent features on Mars exploration).

12.7.5 Recommendations: Contractor shall provide the ability to offer content recommendations to external visitors based on the aggregate behavior of other visitors, e.g., an automatically generated collection of links to "People who read this also read . . ."

12.7.6 Tagging
- 12.7.6.1 Contractor shall allow external visitors to "tag" content with keywords through an open-text field
- 12.7.6.2 Contractor shall prescreen tags for objectionable phrases including possible variants.
- 12.7.6.3 Contractor shall allow moderation of tags.
- 12.7.6.4 Contractor shall ensure tags are coming from users not from automated systems.
- 12.7.6.5 Contractor shall allow removal of tags.
- 12.7.6.6 Contractor shall provide the ability to automatically aggregate content by common tags.
- 12.7.6.7 Contractor shall provide the ability to analyze user tags and develop them into a "folksonomy."

12.7.7 Tag Cloud: Contractor shall provide the ability to create and embed in Web pages a "tag cloud", that is, a visual representation of user tags, search queries or other text elements that visually conveys an assigned value to each element (e.g., "most frequent search queries")

12.7.8 Social Bookmarking

12.7.8.1 Contractor shall provide external visitors with the ability to bookmark or share NASA content to third-party social sites such as Twitter, Facebook, Digg, Deli.cio.us, Reddit and others

12.7.8.2 Contractor shall provide InsideNASA users with the ability to bookmark content on a social bookmarking site internal to NASA. (NOTE: Currently supplied via https://tag.connect.nasa.gov, a GOTS product to be provided by NASA.)

12.7.9 Moderated Live Chat.

12.7.9.1 Contractor shall provide a moderated text chat capability.

12.7.9.2 Contractor shall provide a means for chat users to submit questions during a live chat and receive answers.

13 Software Services – Enterprise Search

13.1.1 This section describes the search capability contractor shall provide, including: simple and advanced search; the ability to index multiple repositories and file formats; the ability to index and search access-controlled repositories and return appropriate results to authenticated users.

13.1.2 Contractor shall review existing NASA enterprise search capabilities and incorporate appropriate solutions into the enterprise search service defined by the following requirements.

13.1.3 Public Search and Access-Controlled Search for Authorized Users

13.1.3.1 Contractor shall provide a public search capability that allows external visitors to search across all publicly available NASA web content

13.1.3.2 Contractor shall prevent public search users from gaining access to access-controlled content

13.1.3.3 Indexing. Contractor shall index:

13.1.3.3.1 all publicly accessible content in the *.nasa.gov domain.

13.1.3.3.2 all collections listed on http://nen.nasa.gov/portal/site/llis/search/collection/ .

13.1.3.3.3 Contractor shall index at least 22 million documents for the search repository at contract start and the amount specified for subsequent contract years.

13.1.3.3.4 The indexing function shall index:

13.1.3.3.4.1 common document and file types and format.

13.1.3.3.4.2 contents in standard data bases.

13.1.3.3.4.3 database driven web-pages, content management systems and its associated metadata.

13.1.3.3.4.4 secure databases and repositories using automated authentication and authorization mechanisms, including http authentication, form-based authentication and NTLM.

13.1.3.3.4.5 external metadata repositories and their associated documents

13.1.3.3.4.6 documents and file types in common use across NASA external web sites, including Microsoft Office documents and Adobe PDF files, common video, audio and image formats (e.g., JPEG, GIF, MP3, MP4, TIFF and others).

13.1.3.3.4.7 indexes shall be kept current to prevent users from being presented with search results that link to content that is no longer available.

13.1.3.3.4.8 Contractor shall re-index a site outside the normal indexing cycle upon request by the site owner.

13.1.3.3.4.9 Contractor shall exclude scientific data formats, (e.g., CDF, HDF, FITS).

13.1.3.3.4.10 Contractor shall not index sites that use the "robots.txt" convention to avoid being indexed.

13.1.3.4 Metadata

13.1.3.4.1 Contractor shall provide a system that captures metadata from indexed documents consistent with Dublin Core standards.

13.1.3.4.2 Contractor shall provide and support sufficient metadata for objects stored within the system to allow indexing and searching based on the Dublin Core and NASA Taxonomy standard (e.g., the machine-aided indexing available at http://mai.larc.nasa.gov).

13.1.3.4.3 Contractor shall provide search users the ability to refine searches according to the captured metadata

13.1.3.5 Browse

13.1.3.5.1 Contractor shall provide a browse capability to allow search users to drill down into search results.

13.1.3.5.2 The browse capability shall:

13.1.3.5.2.1 list search results with limited metadata fields and abstract

13.1.3.5.2.2 generate search results in list format (vs. table format)

13.1.3.5.2.3 allow search users to print what is displayed on the screen

13.1.3.5.2.4 save formatted browse contents to a file

13.1.3.5.2.5 be presented with search-query results so as to allow the user to browse topics relevant to their search query.

13.1.3.6 Search Queries

13.1.3.6.1 Contractor shall provide search users with these capabilities for conducting searches:

13.1.3.6.2 The capability to scope and limit searches to specific collections, repositories, systems, databases, web sites and domains.

13.1.3.6.3 Full text search.

13.1.3.6.4 Keyword search.

13.1.3.6.5 Search by file format.

13.1.3.6.6 Ranking of search results by relevancy or date.

13.1.3.6.7 Select a subset of results within which to search.

13.1.3.6.8 Use of a thesaurus.
13.1.3.6.9 Use of wildcard characters.
13.1.3.6.10 Use of Boolean operations.
13.1.3.6.11 Different levels of search including simple and advanced (including tiered, and by metadata).
13.1.3.6.12 Pre-canned searches (e.g., on "JPL", on "my name", "what's new").
13.1.3.6.13 Exact phrase and string searches.
13.1.3.6.14 Use of natural-language queries.
13.1.3.6.15 Ability to save and name a search.
13.1.3.6.16 Ability to recall a search.
13.1.3.6.17 Ability to modify a recalled search.
13.1.3.6.18 Ability to create a short-cut link to a pre-canned search.
13.1.3.6.19 A web-based interface.
13.1.3.6.20 Ability to sort by date.
13.1.3.6.21 Choose to see results in either sort-table or browse.
13.1.3.6.22 Ability to toggle back and forth between sort table and browse formats. (Sort table is how the hits from the sort are presented).
13.1.3.6.23 Ability to drill down on search results through dynamically generated faceted navigation.
13.1.3.6.24 Tag and specify the source of search result items, e.g. Lessons Learned, KM, Mishaps, etc.
13.1.3.6.25 A user interface for users and subject matter experts to tag and save relevant content with additional metadata and keywords.
13.1.3.6.26 Spell check of queries and suggest alternate search terms.
13.1.3.6.27 Ability to tune search results such that certain content shall have higher ranking.
13.1.3.6.28 Auto-fill capability that suggests terms from the NASA Thesaurus or other designated source to the user as the user is typing the query.

13.1.3.7 Sort

13.1.3.7.1 For the accessed-controlled search for authorized users, the system shall be able to display search results on a sort table.
13.1.3.7.2 The systems shall clearly indicate the search and sort criteria used to create the sort table
13.1.3.7.3 The system shall allow users to modify the sort table display, which includes the ability to:
13.1.3.7.3.1 Sort up or down on headers and/or columns.
13.1.3.7.3.2 Select data to be presented in sort table.
13.1.3.7.3.3 Ability to save formatted sort contents to a file.
13.1.3.7.3.4 Ability to export using tab or comma-delimited format.
13.1.3.7.3.5 The system shall provide the capability to print what's on the screen.

13.1.3.8 Crowd behavior and folksonomy

13.1.3.8.1 In addition to the foregoing, contractor shall provide search results based on crowd behavior, assessing in aggregate which search results search users found the most useful.

13.1.3.8.2 Contractor shall present users with both raw search results and search results based on crowd behavior.

13.1.3.8.3 Contractor shall provide the tools that shall allow NASA and external audiences to collaboratively develop a initial folksonomy.

13.1.3.8.4 Contractor shall analyze search users' crowd behavior and provide feedback for optimizing content and architecture based on that behavior.

13.1.3.9 Directory

13.1.3.9.1 Contractor shall provide a browsable directory of NASA web sites tied to an underlying information architecture and metadata including but not limited to the NASA Taxonomy at http://nasataxonomy.jpl.nasa.gov.

13.1.3.10 Presentation

13.1.3.10.1 The search tool provided by the contractor shall segregate search results by type: HTML file (or web page), image, video, and news (HTML files published to news directories designated by the Office of Communications).

13.1.3.10.2 Search results for images and video shall include a thumbnail of the image or video in the presentation.

13.1.3.11 Contractor responsibilities

13.1.3.11.1 The contractor is responsible for continuous monitoring of enterprise search results relevance.

14 Software Services – Analytics and Metrics Reporting

14.1.1 General Requirement: The contractor shall provide performance and usage metrics to NASA to monitor and improve services and features.

14.1.2 User Metrics: The contractor shall provide a secure, authenticated, Web-based metrics reporting site with access to current and historical data dating back to Jan. 31, 2003. Historical data in Common Log Format up to the contract start date shall be provided as part of the contract transition. NOTE: NASA has a waiver to use persistent cookies to collect aggregated user metrics.

14.1.2.1.1 Contractor shall aggregate usage metrics on an hourly, daily, weekly, monthly and annual basis for each site provisioned in this infrastructure.

14.1.2.1.2 Contractor shall track metrics for logical collections of related content designated by NASA, with the capability to track individual URLs or media objects.

14.1.2.1.3 Contractor shall maintain and retain metrics reports throughout the period of performance.

14.1.2.1.4 Contractor shall maintain access to raw log files for historical analysis consistent with NASA's record retentions schedule, NPR 1441.1D.

14.1.2.1.5 Contractor shall provide user-metric data and analysis to NASA.

14.1.2.1.5.1 Metrics Analysis – Contractor shall provide additional reports and special analyses on authorization by NASA under the IDIQ portion of this contract.

14.1.2.1.5.2 Contractor shall integrate "click tracks" data from www.nasa.gov, such as search terms and navigation paths, with the Foresee Results Customer Satisfaction Survey.

14.1.3 Performance metrics: Contractor shall ensure system performance meets the levels outlined in the Service Level Agreement,.

14.1.4 Bandwidth metrics

14.1.4.1.1 Contractor shall provide tools which report bandwidth usage of Web sites and applications utilizing the enterprise web services

14.1.5 Storage metrics

14.1.5.1.1 Contractor shall provide tools which report disk and database storage usage of Web sites and applications utilizing the enterprise web services

14.1.6 Search performance metrics

14.1.6.1.1 Contractor shall provide tools which report search performance as well as search results relevance and customer satisfaction.

14.1.7 Definitions to be used in analytics

14.1.7.1.1 Page view: Contractor-provided tool shall count as page views only requests for full HTML files. The tool shall exclude from the count of page views all files ending in .rss, xml, .asx, .js, .swf, .ics and other extensions that indicate a file is not a full web page.

14.1.7.1.2 Visitor session: Contractor-provided tool shall count as a visitor session only those calls to the server that can be reasonably construed to be coming from a person using a web browser or mobile device. The tool shall exclude from visitor counts hits to RSS feeds and spidering by robots.